

## Case Report

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# Rehabilitation of ocular defect: A modified technique to produce corneal prominence

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### Abstract:

Esthetics is a vital social concern. The loss of any part of the body can be an extremely discouraging occasion in a person's life. Loss of an eye because of tumors, congenital abnormalities, and trauma is one such troublesome situation. Eye prosthesis boosts the morale and makes the life socially acceptable. A correctly placed ocular prosthesis should reestablish the normal opening of the eye, support the eyelids, reestablish a degree of movement, and be satisfactorily held and esthetically satisfying. A customized acrylic eye fulfills all these requirements. In the current article, a new and economic technique was used to duplicate corneal prominence using a clear acrylic shell. The characterization was further done to give a life-like appearance to the eye prostheses.

### Keywords:

Esthetics, eye movement, ocular prosthesis, prosthodontics

## Introduction

Inherent disfigurements, tumors, and procured traumatic lesions of an eye may prompt enucleation or evisceration.<sup>[1]</sup> The loss of an eye can be a very distressing event in a person's life, both medically and emotionally. Physical deformity often compromises appearance or function, which affects the person's day-to-day life. This usually pushes the individual to pursue treatment that will reinstall the normalcy of life.<sup>[2]</sup> Eye prosthesis boosts the morale and makes the life socially acceptable.<sup>[2,3]</sup> The stock acrylic resin eyes were manufactured to meet the increasing demand. The fitting of stock eyes was quite fast, but the results were not satisfactory.<sup>[4]</sup> A customized acrylic resin artificial eye has turned out to be the most attractive and satisfactory esthetic substitution. Following case report illustrates a novel technique to duplicate the corneal prominence and

iris using iris button and rehabilitation of ocular defect.

## Case Report

A 58-year-old male patient reported to the Department of Prosthodontics, Saraswati Dental College, Lucknow, with an enucleated left eye. The patient lost his eye after an incident of chicken pox at the age of 6 years. The enucleated socket was inspected to determine the depth and degree of mobility of the socket [Figure 1a]. It was decided to rehabilitate the patient with a custom-made ocular prosthesis for a better fit, retention, and esthetics. The treatment procedures were explained to the patient before the commencement of the procedures, and informed consent was obtained.

### Procedure

The patient was instructed to look straight ahead at a preselected object. Primary impression was made using ophthalmic alginate loaded into a 5-ml disposable

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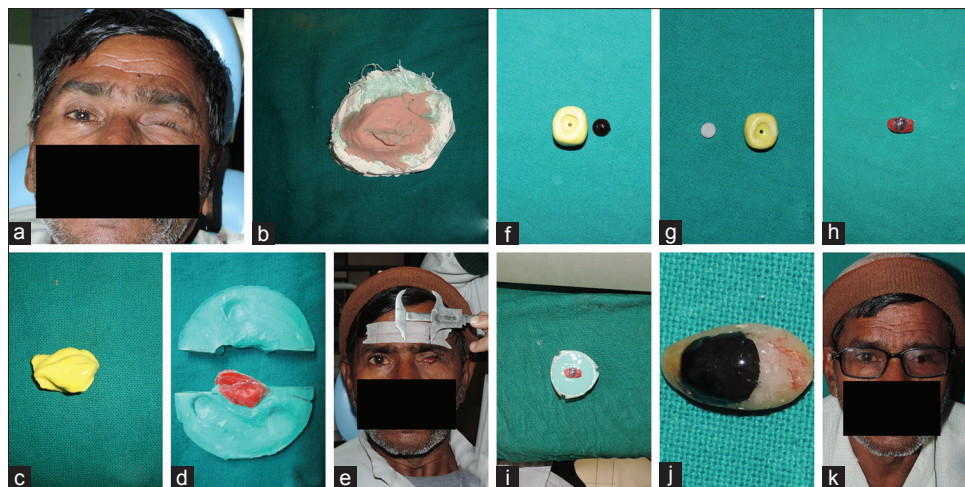
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**Figure 1:** (a) Patient with ocular defect. (b) Primary impression of the socket with alginate. (c) Secondary impression with polyether. (d) Split cast with wax pattern. (e) Wax pattern trial with determination of location of iris. (f) Putty index of iris button. (g) Duplication of corneal prominence using clear acrylic auto polymerizing resin. (h) Wax pattern with corneal prominence. (i) Investing of wax pattern in the crown flask. (j) Finished ocular prosthesis with characterization. (k) Patient with finished ocular prosthesis in place

syringe (without needle) [Figure 1b]. Cast was poured over this impression and custom tray was fabricated. Escape vents were made on the custom tray and the hub of the disposable syringe was attached over it. With custom tray in position, polyether impression material was injected, and the patient was instructed to make eye movement [Figure 1c]. The impression was taken out, and two-piece split cast mold was poured [Figure 1d].

Wax pattern was fabricated on the split cast and tried into the clinical defect. The wax pattern was modified to duplicate the shape of the natural eye. The eyelid drape of both eyes was matched after placing the wax pattern. The position of the iris was decided according to the contralateral natural eye. An adhesive tape was adhered over the forehead of the patient. The patient was asked to look straight, and a midline was marked over the tape. A second marking was made to mark the middle of the pupil. The distance between these two marked lines was measured and transferred on the defect size to locate the position of iris over the wax pattern [Figure 1e].

### Fabrication of iris part

The iris button was used to duplicate the iris with autopolymerizing clear acrylic resin. A putty index of iris button was made using heavy-body elastomeric impression material [Figure 1f]. The index was lined with a thin layer of autopolymerizing resin. Once the resin was set, the pattern was taken out [Figure 1g]. A digital photograph of contralateral eye was taken and printed over a glossy photo paper. The iris portion from the photo was cut and was placed over the resin pattern. It was covered with cyanoacrylate to make it impermeable to fluids. This complete iris portion was now placed and adjusted, creating a space over the wax pattern on the location determined by the markings made on the

forehead of the patient [Figure 1h]. The symmetry and location of the iris were checked by asking the patient to perform eye movement in different directions. This step motivated the patient and inculcated confidence in him.

### Processing of ocular prosthesis

The wax pattern was invested in a small flask (crown flask) and dewaxing was done in the conventional manner [Figure 1i]. To improve the characterization (e.g., simulation of the blood vessels) of the ocular prosthesis, acrylic threads/fibers were separated from the veined heat cure material [Figure 1j] (Trevalon HI, Dentsply). The mold was packed with preselected shade of tooth-colored heat-cure polymerizing resin (DPI, India). Long curing cycle of 4–6 h was used for acrylization.

After the retrieval of prosthesis, finishing was done. Once the fit was checked, polishing was done to give it a glossy appearance. Prosthesis was disinfected and was then finally placed into the socket. Postinsertion instructions were given to the patient [Figure 1k]. Follow-up was done after 1 week. The patient was satisfied with the fit and appearance of eye prosthesis.

### Discussion

With the advancement in dental materials, the socket can be finely recorded on which custom-made ocular prosthesis can be created with exact fit and esthetics.<sup>[4]</sup> Impression making is a vital procedure during the creation of ocular prosthesis. The literature depicts different procedure such as utilization of stock tray with alginate for stock impression and a custom tray with elastomeric impression material for the final impression.<sup>[4-8]</sup> The custom tray depends on the patient's existing anatomy and thus results in intimate adaptation

of the eye prostheses to enucleated socket.<sup>[9,10]</sup> Intimate adaptation of ocular prosthesis increases the movement of prosthesis and complements its natural appearance.<sup>[2]</sup>

Till now, the iris button was used as a corneal prominence. In such cases, every time a new iris button was needed, this added to the cost of procedure. In the current article, the iris button was duplicated in the form of a thin shell using clear acrylic resin. The putty index made to duplicate it can be used every time to produce corneal prominence shell, eliminating the use of new iris buttons. The characterization of eye prosthesis gave a life-like appearance enhancing the overall esthetics. The use of rayon thread fibrils was used to simulate vasculature, by monomer-polymer syrup method.<sup>[10]</sup> In this case report, to save time, acrylic threads/fibers were separated from the veined heat-cure material (Trevalon "HI", Dentsply).

### Conclusion

This case report depicts a novel system to duplicate the corneal prominence and iris utilizing iris button and restoration of the ocular defect. Characterization of the ocular prosthesis was another viewpoint that necessities more discourse. Such prosthesis provides extraordinary psychological advantage and reestablishes the cosmetic appearance of the patient.

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### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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### Conflicts of interest

There are no conflicts of interest.

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